AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

In the claims

Claim 1 (original): A method of controlling birefringence in an arrayed waveguide grating comprising:

determining a stress distribution in a top cladding layer and in at least one waveguide in the arrayed waveguide grating over a change in manufacturing temperature;

determining a relationship between polarization dependent wavelength and a width of the waveguide from the stress distribution; and

selecting the width of the waveguide such that the polarization dependent wavelength is a predetermined value.

Claim 2 (original): The method of claim 1 wherein the predetermined value is a minimized polarization dependent wavelength.

Claim 3 (original): The method of claim 1 further comprising determining an elastic modulus of each of the top cladding layer and the waveguide prior to determining the stress distribution.

Claim 4 (original): The method of claim 3 further comprising determining a coefficient of thermal expansion in each of the top cladding layer and the waveguide.

Claim 5 (original): The method of claim 1 wherein determining the relationship between polarization dependent wavelength and the waveguide width from the stress distribution further comprises mapping the stress distribution into an index distribution.

Claim 6 (original): The method of claim 5 further comprising determining an effective index of each of the waveguide and the top cladding.

Claim 7 (original): The method of claim 1 wherein determining the relationship between polarization dependent wavelength and the waveguide width from the stress distribution further comprises determining a distribution of refractive index in the top cladding from the stress distribution.

Claim 8 (original): The method of claim 2 wherein the minimized polarization dependent wavelength is zero.

Claim 9 (original): The method of claim 1 wherein the top cladding layer is disposed over the waveguide.

Claim 10 (original): The method of claim 9 wherein the top cladding layer is disposed over a substrate.

Claim 11 (original): The method of claim 10 wherein the substrate comprises silicon.

Claim 12 (original): The method of claim 10 wherein the substrate has a thickness of about 625 μm.

Claim 13 (original): The method of claim 10 wherein the substrate is disposed over a first layer of SiO_2.

Claim 14 (original): The method of claim 13 wherein a second layer of SiO_2 is disposed over the substrate.

Claim 15 (original): The method of claim 13 or 14 wherein the SiO_2 has a thickness between about 15-30 μm.

Claim 16 (original): The method of claim 15 wherein the SiO_2 has a thickness of about 15 μm.

Claim 17 (original): The method of claim 1 wherein the waveguide further comprises at least one dopant.

Claim 18 (original): The method of claim 17 wherein the at least one dopant is selected from the group consisting of Germanium and Phosphorus.

Claim 19 (original): The method of claim 1 wherein the waveguide comprises at least one material selected from the group consisting of polyacrylates, polymethacrylates, polysilicone, polyimide, epoxy, polyurethane, polyolefin, polycarbonate, polyamides, polyesters, acrylate-methacrylate copolymers, acrylic-silicone copolymers, epoxy-urethane copolymers, and amide-imide copolymers.

Claim 20 (original): The method of claim 1 wherein the waveguide has a height between about 5-8 μm.

Claim 21 (original): The method of claim 20 wherein the waveguide has a height of about 6 μm.

Claim 22 (original): The method of claim 1 wherein the top cladding layer further comprises a dopant.

Claim 23 (original): The method of claim 22 wherein the dopant comprises Boron.

Claim 24 (original): The method of claim 23 wherein the Boron ranges between about 6-9% by weight.

Claim 25 (original): The method of claim 1 wherein the change in manufacturing temperature is about 900° C.

Claim 26 (currently amended): An arrayed waveguide grating which controls birefringence comprising:

a substrate;

a top cladding layer disposed upon the substrate, wherein the top cladding layer includes a dopant between about ~~2-9%~~ 6-9% by weight; and

at least one waveguide having a width and a height disposed between the substrate and the top cladding layer,

the width of the waveguide being selected such that a polarization dependent wavelength is a predetermined value.

Claim 27 (original): The arrayed waveguide grating of claim 26 wherein the predetermined value is a minimized polarization dependent wavelength.

Claim 28 (original): The arrayed waveguide grating of claim 26 wherein the polarization dependent wavelength is determined from a stress distribution in the top cladding layer and in the waveguide over a change in manufacturing temperature.

Claim 29 (original): The arrayed waveguide grating of claim 26 wherein the top cladding layer comprises a predetermined composition.

Claim 30 (original): The arrayed waveguide grating of claim 28 wherein the polarization dependent wavelength is further determined from an elastic modulus of each of the top cladding layer and the waveguide.

Claim 31 (original): The arrayed waveguide grating of claim 30 wherein the polarization dependent wavelength is further determined from a coefficient of thermal expansion in each of the top cladding layer and the waveguide.

Claim 32 (original): The arrayed waveguide grating of claim 27 wherein the minimized polarization dependent wavelength is zero.

Claim 33 (original): The arrayed waveguide grating of claim 26 wherein the substrate comprises silicon.

Claim 34 (original): The arrayed waveguide grating of claim 26 wherein the substrate has a thickness of about 625 μm.

Claim 35 (original): The arrayed waveguide grating of claim 26 wherein the substrate is disposed over a first layer of SiO_2.

Claim 36 (original): The arrayed waveguide grating of claim 35 wherein a second layer of SiO_2 is disposed over the substrate.

Claim 37 (original): The arrayed waveguide grating of claim 35 or 36 wherein the SiO_2 has a thickness between about 15-30 μm.

Claim 38 (original): The arrayed waveguide grating of claim 37 wherein the SiO_2 has a thickness of about 15 μm.

Claim 39 (original): The arrayed waveguide grating of claim 26 wherein the waveguide further comprises at least one dopant.

Claim 40 (original): The arrayed waveguide grating of claim 39 wherein the at least one dopant is selected from the group consisting of Germanium and Phosphorus.

Claim 41 (original): The arrayed waveguide grating of claim 26 wherein the waveguide comprises at least one material selected from the group consisting of polyacrylates, polymethacrylates, polysilicone, polyimide, epoxy, polyurethane, polyolefin, polycarbonate, polyamides, polyesters, acrylate-methacrylate copolymers, acrylic-silicone copolymers, epoxy-urethane copolymers, and amide-imide copolymers.

Claim 42 (original): The arrayed waveguide grating of claim 26 wherein the waveguide height is between about 5-8 μm.

Claim 43 (original): The arrayed waveguide grating of claim 42 wherein the waveguide height is about 6 μm.

Claim 44 (cancelled)

Claim 45 (previously presented): The arrayed waveguide grating of claim 26 wherein the dopant comprises Boron.

Claim 46 (cancelled)

Claim 47 (original): The arrayed waveguide grating of claim 28 wherein the change in manufacturing temperature is about 900° C.

Claim 48 (cancelled)

Claim 49 (previously presented): An arrayed waveguide grating manufactured according to the method of claim 1.

Claim 50 (previously presented): An arrayed waveguide grating manufactured according to the method of claim 22.